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ABSTRACT

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ED 370 422

DERIVING THE DISTRIBUTION OF CONJUNCTIONS

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Abstract: This paper proposes an explanation for the limited possibilities of realized conjunctions in multitermed coordinations. It claims that conjunction (&) heads a fully articulated phrase (&P), which can iterate &P-shells, similar to V in Larson's VP-shell hypothesis. This structure enables a single & to unify any number of conjuncts (at LF), and thereby accounts for cases in which only a single overt & appears. Instances in which multiple &s surface are best understood as a PF condition on realizing emphasis.

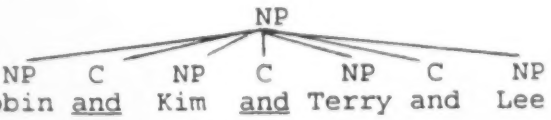
The Puzzle

The distribution of overt conjunctions in multitermed coordinations is extremely limited. A conjunction must appear before (or cliticize to) the final conjunct, and may appear between each conjunct; no other options are possible:

1. a. Robin, Kim, Terry, and Lee
   b. Robin, and Kim, and Terry, and Lee
   c. *Robin, and Kim, Terry, Lee
   d. *Robin, Kim, and Terry, Lee
   e. *Robin, and Kim, and Terry, Lee

The form in (1a) presents the standard reading; (1b) places an emphasis on each conjunct. Most syntactic literature assumes that coordination has a flat structure, with a base-generated conjunction between each term, as in:

2.



In the standard view, the underlined forms represent those which can undergo Conjunction Reduction (CR) to yield the sequence of (1a). Should CR not apply, the emphatic reading of (1b) results. However, this account suffers from several problems. First, the structure in (2) clearly violates X-bar theoretical requirements, and does not conform to the general restriction on binary branching. Furthermore, the

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process of CR is purely stipulative. Note that Japanese, a head-final language, also requires that a conjunction appear before the final conjunct (*to* 'and' coordinates NPs):

3. a. Robin, Kim, Terry to, Lee
   b. Robin to, Kim to, Terry to, Lee
   c. *Robin to, Kim, Terry, Lee
   d. *Robin, Kim to, Terry, Lee
   e. *Robin to, Kim to, Terry, Lee

No theoretical principles dictate that only the final conjunction should resist CR regardless of the head-parameter of the language.

The flat structure of coordination therefore fails. Any competing representation, however, must account for the following at first puzzling facts:

- A single lexically realized conjunction can unite more than two conjuncts.
- The occurrence of an overt conjunction between each conjunct provides one means of attaining emphasis.
- If there is a single conjunction, it must precede the rightmost conjunct, regardless of language.

This paper contains an analysis which derives the above facts through principled means, while remaining within the so-called Government-Binding tradition. Importantly, this work will adopt the Minimalist approach of Chomsky (1992), which recognizes only the representational levels of Phonetic Form (PF) and Logical Form (LF).

Conjunction as a Syntactic Head

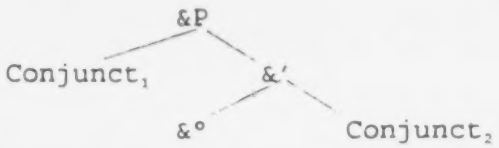
The analysis begins with the following claim: conjunction is a functional element (call it &) that heads its own fully articulated category (&P). This position is not entirely new; among others, Abney (1987), Collins (1988) and Munn (1992) have suggested the functional nature of &. Note that & possesses the following characteristics that Abney (1987: 64-5) holds indicative of functional elements:

- Functional elements constitute closed lexical classes.
- Functional elements are generally phonologically and morphologically dependent. They are generally stressless, often clitics or affixes, and sometimes even phonologically null.

·Functional elements lack..."descriptive content..." They mark grammatical or relational features, rather than picking out a class of objects.

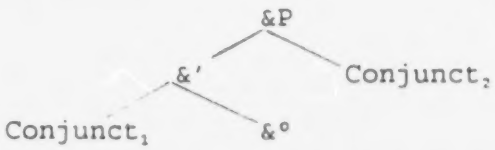
Given that & satisfies the above traits as do other functional elements such as Det, C, and Agr, it follows that & too should head a complete syntactic phrase, which projects its own specifier and complement positions:

4.



The above depicts a two-termed coordination in English; a head-final language such as Japanese presents a mirror-image:

5.



Assume that a conjunct enters a coordination by virtue of a structural relationship with an &° at LF; either a head-complement or specifier-head relation suffices to bring a conjunct within the coordination. Should a conjunct not stand in an appropriate relation to an &° at LF, the coordination is illformed.

Prosodic facts support the &P-structures represented here. As is well-known, in English the conjunction forms a prosodic unit with the second conjunct, while in Japanese the conjunction joins with the first conjunct (commas represent phrasal breaks):

6. a. Robin, and Kim
   b. *Robin and, Kim
   c. Robin to, Kim
   d. *Robin, to Kim

These facts fall out under the current proposal; in both languages the constituent of &' proves the relevant one to prosody. The flat structure of coordination cannot arrive at the facts as directly.

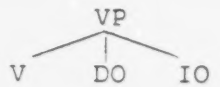
The &P-structure shown thus far provides a means

of coordinating two conjuncts, but cannot yet represent multi-termed coordinations while still conforming to X-bar theoretical principles. An extension of Larson's (1988, 1990) VP-shell hypothesis applied to conjunction, however, enables this. A brief review of Larson's idea ensues, followed by its extension to the &P-structure.

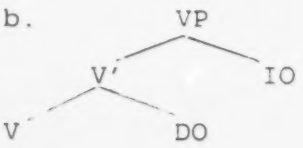
The VP-Shell

Larson (1988) notes the inadequacy of previous representations of double-object constructions as in 'Robin sent a letter to Kim':

7. a.



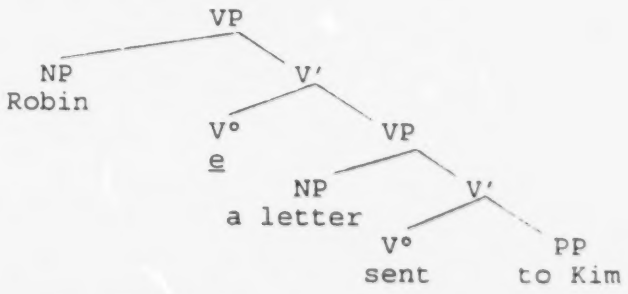
b.



The representation of (7a) contravenes the restriction to binary branching. In (7b), the indirect object stands apart from the verb and direct object; Larson (1988: 336-41) shows, though, that at some level the verb and indirect object should form a semantic/syntactic unit. As but one evidence, consider idiom chunks; in 'Robin threw Kim to the wolves', undeniably 'throw to the wolves' constitutes a single unit of meaning.

Larson therefore suggests a structure in which a V° position takes a VP as its complement, resulting in VP-shells. The underlying structure of 'Robin sent a letter to Kim' under this idea becomes:

8.

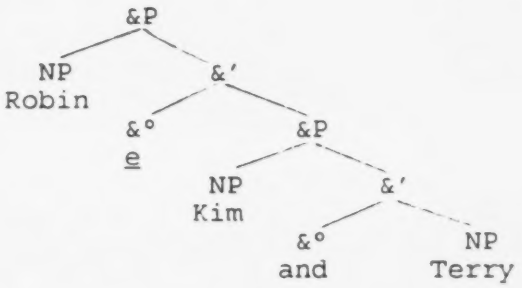


The verb raises to fill the underlyingly empty V° position for Case and agreement purposes, which yields the proper surface order. The verb together with the indirect object forms a constituent, that of V'; all branching is binary.

Application to &P

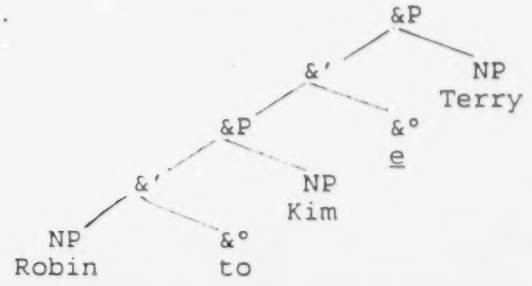
Since the VP-shell hypothesis does well in representing superficially ternary structures, it follows to apply a similar idea to coordination as well; differing only in not assuming an upper bound on the number of possible &P-shells. Doing so yields the following representation of a three-termed English coordination:

9.



Any coordination with *n* terms will have *n-1* &P nodes. The single lexical conjunction always occupies the lowest &° position. This holds in head-final languages as well:

10.



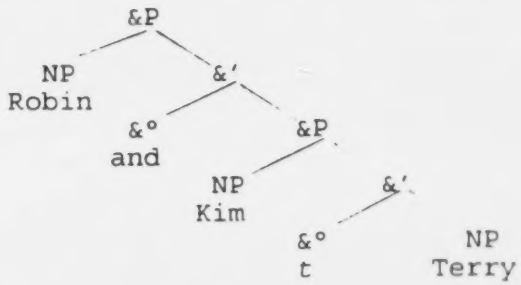
Adoption of the &P-shell hypothesis has two important consequences: It keeps coordination within binary branching restrictions, and depicts a coordination as having a single underlying conjunction. The desirability of the latter will become apparent in subsequent sections.

&°-Movement

Recall the earlier assumption that conjuncts enter a coordination by virtue of their structural relationship with an &° term. An underlyingly empty &° position cannot conjoin a conjunct, just as in the VP-shell hypothesis an empty V° position cannot satisfy Case and agreement requirements. Coordinations with more than two terms, then, dictate movement of the &°;

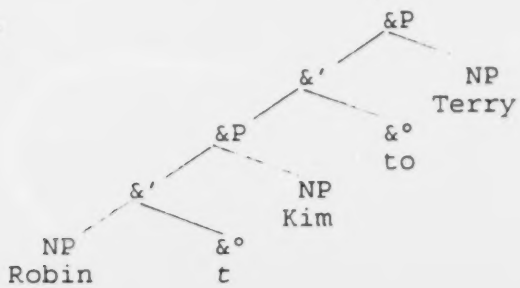
a Form-Chain operation (see Chomsky (1992: 21)) conjoins all terms appropriately. In English, this movement generally occurs at LF. After realization of the PF structure in (9), for example, the &° raises at LF so that it stands in an appropriate position to conjoin the highest conjunct through a specifier-head relation:

11.



In Japanese, an &° also undergoes Form-Chain to coordinate all conjuncts. Japanese differs from English, however, in that it requires this movement at PF instead of LF, for reasons to be explained shortly. The representation becomes:

12.



The movement shown above renders the correct surface order for phonetic interpretation; each conjunct stands in an appropriate structural relation with an &° for subsequent checking at LF. Both head-initial and head-final languages manage to bring all conjuncts into the coordination through structural relations with an &°, and differ only in at which level they do so. The first part of the puzzle now has an answer: A single conjunction can coordinate any number of terms by virtue of its chain-formation in &P-shells.

Realizing Emphasis

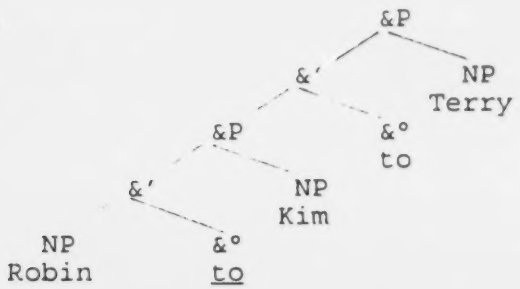
Clearly, phonological stress provides one means of creating an emphatic or focused reading; 'ROBIN went to the store' carries more emphasis than does 'Robin went

to the store'. Assume, then, that emphatic readings result from PF phenomena.[1] Given this, the present analysis yields a straightforward account of how the grammar realizes emphatic coordinations such as 'Robin and Kim and Terry'. Specifically:

13. An emphatic reading of a coordination may result from the phonetic realization of the traces of the &°-chain at PF.

Consider first the Japanese case. The &° has left a trace in the lowest &° position at PF; when this trace copies the phonetic interpretation of its antecedent, the correct emphatic results (the underlined form shows the 'trace come to life'):

14.

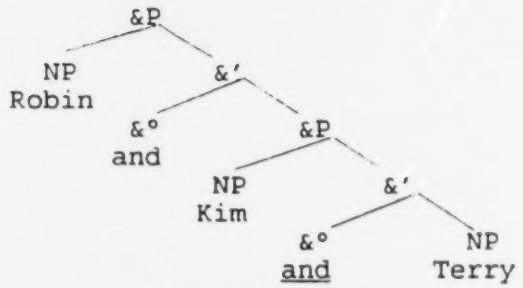


Because all traces in &°-positions result from a single Form-Chain operation, it follows that to attain the emphatic reading they will all assume phonetic content, regardless of the number of conjuncts. The analysis therefore correctly predicts (15a) as good, and the other forms of (15) as ungrammatical:

15. a. Robin <u>to</u> Kim <u>to</u> Terry to Lee
b. *Robin *t* Kim <u>to</u> Terry to Lee
c. *Robin <u>to</u> Kim *t* Terry to Lee

Now turn to English. As noted, in English, &°-raising generally occurs at LF. However, since emphasis is a PF phenomenon, reaching the emphatic reading of a coordination in English requires an earlier movement, at PF, instead. The following shows this result:

16.



The realized trace above occupies the position where the conjunction would stand in an non-emphasized coordination; the crucial difference between (9) and (16) is the presence of a lexical &° between the first two conjuncts in the latter, which contributes to the desired emphasis. Again, because &°-chain formation is a single operation, all traces assume content at once. The second aforementioned puzzling fact now has an explanation; the analysis correctly accounts for the fact that such emphatic readings require an overt conjunction between each conjunct through trace realization.

The analysis also correctly predicts that all such conjunctions will be phonetically identical, because the realized traces are in fact manifestations of the same single base-generated &°. For instance, from the movement as shown in (17a), (17b) but not (17c) can result to form an emphatic:

17. a. Robin and Terry *t* Kim *t* Lee
    b. Robin and Terry and Kim and Lee
    c. *Robin and Terry or Kim and Lee

Japanese provides an even stronger example. In Japanese both *to* and *ya* can conjoin NPs and translate as 'and'.[2] Note that they may not 'mix and match' to form an emphatic reading:

18. a. Robin to Kim to Terry to Lee
    b. Robin ya Kim ya Terry ya Lee
    c. *Robin ya Kim to Terry to Lee
    d. *Robin to Kim ya Terry ya Lee

Theories of coordination which take each conjunction to be individually base-generated cannot arrive at the above facts without stipulation. This criticism applies to other efforts to bring conjunction within X-bar theory (e.g., Collins (1988)), and to any theoretical framework which assumes a phrase structure

rule of the type: X → X Conj X.[3] Only the present analysis, which shows a single base-generated &° term per coordination, arrives at the facts straightforwardly.

Support for the Analysis

The success of the above account hinges on the claim that a trace may assume phonetic content. Although this claim may lack precedent in the theory, it in fact has other useful applications and is not an ad hoc stipulation for coordination alone. Data from topicalization and passive and raising verb constructions demonstrate this.

Consider first topicalization. Assume that topicalization consists of movement of a phrase which adjoins to CP, as in:

19. $[_{TOP}$ Robin $[_{CP}$ Terry likes *t*]
'Robin, Terry likes'

Note now that should the trace assume the phonetic form of its antecedent, the following grammatical form results:

20. Robin, Terry likes Robin

This sentence indeed provides a natural way to emphasize that Robin in fact receives Terry's affection; perhaps the orthography 'Robin--Terry likes Robin!' indicates this more clearly.[4] Further similar examples include:

21. a. Peanuts--Robin asked for peanuts?!
b. Linguists--Kim can't stand linguists!
c. Lee--Terry thinks I like Lee?!

Notice that the underlined form must assume the same form as the topicalized element; generally, even a synonym fails:

22. ?*Peanuts--Robin asked for goobers?!

This suggests that the sentence-final element indeed is a copy of the moved topic rather than a random interjection.

Passive and raising verb data also support the idea of phonetically realized traces. These constructions involve movement of an NP from within the VP to the [SPEC, IP] position that leaves a trace:

23. a. [$_{IP}$ This story$_i$ [$_{I'}$ is [$_{VP}$ believed t_i by all]]]
    b. [$_{IP}$ Robin$_i$ [$_{VP}$ seems t_i to know the answer]]

Again, when the trace takes the phonetic form of its antecedent, a natural emphatic reading results:

24. a. This story is believed--this story!--by all
    b. Robin seems--Robin!--to know the answer

Notice that such an emphatic repetition of the subject may only occur in the location of the trace; other attempts crash:

25. a. *This story is--this story!--believed by all
    b. *This story is believed by--this story!--all
    c. *Robin seems to--Robin!--know the answer
    d. *Robin seems to know--Robin!--the answer

In sum, it appears that traces of argument-chains can indeed assume the phonetic interpretation of their antecedents, expressly for the purpose of attaining emphasis. The analysis of realizing emphatic coordinations therefore comes at no extra theoretical cost.

&° as a Case Assigner

Recall the earlier claim that for nonemphatic readings, &°-movement in English takes place at LF, while in Japanese it occurs at PF. This distinction has the correct consequence of showing an overt &° as preceding the rightmost conjunct in all languages, but needs explanation; otherwise the present analysis will remain as stipulative as earlier CR accounts. In fact, given the &P-structure proposed here, the difference results from independent principles.

Consider: since &P is a maximal projection of a functional element, it blocks Case assignment from the verb to an NP in constructions such as the following:

26. [$_{\&P}$ Robin, Kim and Terry] left

The grammaticality of (26), however, indicates satisfaction of the Case Filter. The previous assumption seems to be that the verb assigns Case to the entire coordination:

27. $[_{\&P}$ Robin, Terry and Kim$]_{NOM}$ left

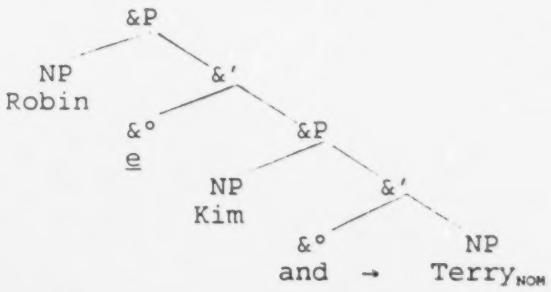
However, standard theory does not normally take functional categories as receiving Case. Furthermore, strictly speaking the Case Filter is not satisfied, inasmuch as an NP does not receive Case. An assumption more in keeping with the spirit of the Case Filter is that the final conjunct bears Case, as in:

28. $[_{\&P}$ Robin, Terry and Kim$_{NOM}]$ left

A single assignment of Case to an NP in a given position (here, [SPEC, IP]) manages to satisfy the Case Filter.[5] Since the verb cannot assign NOM through the functional &P nodes, the lexical &° must be assigning Case in (28). Along with verbs, then, conjunctions can assign Case, and like verbs, they may do so either through a head-complement or specifier-head relationship.

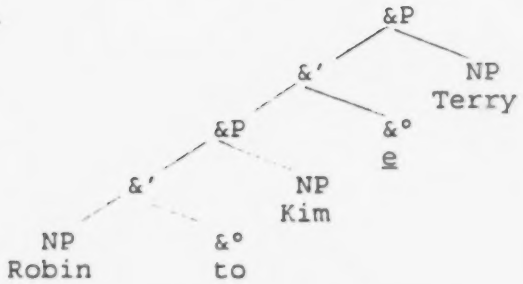
Assume that such &°-Case assignment in some sense incurs 'cost' on the grammar. If so, under Economy considerations it will only occur as a Last Resort, to salvage an otherwise Caseless construction. This explains why an overt conjunction does not raise in English until LF:

29.



Because the lexical &° can assign Case to the last (in linear sequence) NP from its base-generated position, the Case Filter is satisfied at PF, and the raising of the &° to coordinate all terms will not occur until LF in nonemphatic readings (such movement also being subject to Economy considerations, such as Procrastinate). Now turn to the base-generated Japanese construction:

30.



Here, Case assignment of the &° *to* to the NP 'Robin' through a head-complement relation, or to the NP 'Kim' through a specifier-head relation, would violate Economy. The rightmost NP 'Terry' here represents the Last Resort. Therefore, the &° must raise at PF to assign Case to 'Terry'. The Case Filter provides ample motive to override the Procrastinate nature of such &°-movement. All languages therefore realize an overt conjunction before the final NP in a multi-termed coordination for Case purposes, and the analysis therefore needs no stipulative devices such as the CR account does.

Although the notion of &° as a Case assigner may appear odd at first, data from English give it credence. Consider the following:

31. a. I left
    b. *Me left
    c. [Terry and I] left
    d. [Terry and me] left
    e. Robin gave him a nickel
    f. *Robin gave he a nickel
    g. Robin gave [Terry and him] a nickel
    h. Robin gave [Terry and he] a nickel

No speaker ever utters (31b) instead of (31a), nor (31f) for (31e). Yet many speakers freely produce and accept both (31d) and (31h) instead of their prescriptively correct counterparts. This possibility follows from &°'s status as a Case assigner. The Case Filter merely requires that particular positions exhibit Case. Unlike a V°, an &° will not assign a particular Case by virtue of a particular structural relation. It can assign NOM, as it does to 'I' in (31c), for instance, or to 'he' in (31h). An &° can also assign Accusative Case, as it does to 'me' in (31d) and to 'him' in(31g). Although there may be a pervading prescriptive convention for the Case an &° assigns to match that which one normally expects of

that position (e.g. NOM in a subject position), nothing in principle rules out a deviation from this; the &° assigns whichever case it desires, so to speak. The relatively acceptable digressions from the norm in (31) only result when one takes &° as a possible assigner of Case.[6]

Notice too that some languages, such as Chinese, require a lexical &° to coordinate NPs, but not to coordinate other phrases. That is:

32. a. *[Robin, Kim] mai-le yi-ben shu
buy-ASP one-CL book
'Robin, (and) Kim, bought a book'
b. [Robin gan Kim] mai-le yi-ben shu
'Robin and Kim bought a book'
c. Robin [chang qu, tiao wu]
sing song dance dance
'Robin sings a song, (and) dances a dance'

The analysis explains the ungrammaticality of (32a); it is illformed because no lexical &° assigns Case. Note that inserting the conjunction *gan* rescues the sentence. In (32c), a phonetically null &° may coordinate VPs because they do not need Case.

In coordinations in head-final languages of phrases other than NP, an overt conjunction still must precede the ultimate conjunct. For example, note the facts of Japanese coordinated sentences (Japanese *shi* conjoins CPs):

33. a. Robin-ga yomu, Kim-ga nomu shi,
SUB read SUB drink and
Terry-ga neru
SUB sleep
'Robin reads, Kim drinks, and Terry sleeps'
b. *Robin-ga yomu shi, Kim-ga nomu,
Terry-ga neru

(33b) crashes because no coordinator precedes the final clause. This fact naturally does not follow from Case considerations; presumably, though, the grammar prefers a consistent pattern of conjunction, and non-NP coordination must parallel NP-coordination. Though the intuition is clear enough, further investigation is needed to give it substance.

Summary

Recall that coordination phenomena presented three puzzling facts:

- A single lexically realized conjunction can unite more than two conjuncts.
- The occurrence of an overt conjunction between each conjunct provides one means of attaining emphasis.
- If there is a single conjunction, it must precede the rightmost conjunct, regardless of language type.

The analysis presented here arrives at the above facts through principled means. A single conjunction coordinates multiple conjuncts by virtue of its Form-Chain operation targeting all &° positions with its &P-shells. The emphatic reading results from the phonetic realization of all traces of this operation. The necessity of an overt conjunction preceding the final conjunct falls out directly from Economy principles once &° is taken to assign Case.

In short, the proposal of &° as a Case-assigning functional head of iterating maximal projections enables the correct prediction of the distribution of lexical conjunctions without resort to theoretically unmotivated stipulations; all the mechanisms used in the foregoing analysis are independently motivated apart from coordination facts. This success alone goes a long way in justifying the analysis; further research will no doubt uncover further theoretical and empirical benefits it confers.

NOTES

Jim Huang, Naoki Fukui and especially Robert May deserve thanks for their helpful discussion with this paper. An anonymous reviewer contributed several useful suggestions of presentation. Hiromu Sakai kindly helped with the Japanese data, and Teresa Griffith graciously proofread an earlier version of the work. The author naturally assumes responsibility for remaining errors.

[1] This is admittedly a sketchy discussion of emphasis and focus; see Rochemont and Culicover (1990), for example, for further detail.

[2] Japanese *ya* and *to* differ slightly; roughly speaking, a speaker uses *ya* to suggest that the coordination may not be a closed set; the effect is similar to English 'among others, Robin and Kim...' The two coordinators are logically and truth-conditionally equivalent, however.

[3] For instance, Generalized Phrase Structure Grammar (GPSG) as in Sag et al (1985) and Categorial Grammar (CG) as in Steedman (1985) seem particularly susceptible to such a criticism. GPSG is required to posit two separate coordination schemata to account for what we have called the normal and emphatic readings; CG seems entirely unable to guarantee that all conjunctions in a multitermed coordination will be identical.

[4] An anonymous reviewer points out that standard left-dislocation constructions may give a more natural way to express emphasis:

i) Robin$_i$, Terry likes her$_i$

Nonetheless, the topicalized examples under discussion, though perhaps awkward for some speakers, provide a grammatical way to express emphasis or incredulity.

[5] This paper necessarily adopts an (admittedly tentative) interpretation of the Case Filter that differs somewhat from standard theory. It proceeds on the idea that the Case Filter applies to specific positions rather than NPs per se. For example, the [SPEC, IP] position must bear Case somewhere, as must a [COMP, V°] position, and so on. Under this idea, not every NP in (28) must have Case; one instance of Case-assignment satisfies the Case Filter requirements of the [SPEC, IP] position.

[6] Note that under the interpretation of the Case Filter in note (5), only one NP in a coordination needs to receive Case assignment. All other NPs, then, are in a sense free to select how they will surface. For example:

i) [Me and Robin$_{NOM}$] left

Under the present theory, 'and' assigns Case to 'Robin' and leaves the higher NP 'me' alone. Since this higher NP is not subject to any particular Case requirements, it may indeed surface with Accusative Case without contravening any principles, and the sentence as a result remains grammatical. An interesting question, though, is why the following should be so much worse than (i) above:

ii) *[I and Robin] left

Here, the higher NP 'I' actually bears NOM, which one expects to find under [SPEC, IP]; yet the form is bad. This fact poses a mystery for all theories of coordination, and needs further investigation.

The author welcomes readers to send comments or questions via e-mail to ezoerner@orion.oac.uci.edu.

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